

AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Paragraph [0036] on page 11 has been amended as follows:

[0036] However, if the moving object is in the shadow area of the GPS location data as the result of the determination at the step S102, the moving object of the previous last map-matching location data is set to be a reference of the moving location (S108). The present speed is inputted from the sensor (S110).

Paragraph [0037] on pages 11-12 has been amended as follows:

[0037] Here, it is determined whether the speed of the moving object is zero (S112). As the result of the determination, if the speed of the moving object is zero, it is recognized that the moving object stops and the process is terminated. If the speed of the moving object is not zero, it is recognized that the moving object is traveling in the visible shadow region and the moving straight distance is calculated during estimation unit time (S114). For example, if the estimated time is 1 second and the present speed of the moving object is 30 m/sec., the straight distance on which the corresponding moving object can move in a traveling direction is 30 meters per second. The moving direction of the moving straight distance is found in the due north reference angle of link positioned in the traveling direction at the last map-matching location in the visible region.

Paragraph [0042] on pages 13-14 has been amended as follows:

[0042] For example, as shown in FIG. 4 FIG. 3, if the moving object M moves through a visible region A, a shadow area B such as a tunnel and a visible region C in the traveling direction of the moving object, the first location P1 which is map-matching last in the visible region A is referred when the moving object enters the shadow area B.

Paragraph [0045] on page 14 has been amended as follows:

[0045] [Equation 2]

$$\text{Longitude} = \text{longitude of P1} + 10 \text{ m} * \cos (\Theta 1 \text{ of P1})$$

$$\text{Latitude} = \text{latitude of P1} + 10 \text{ m} * \sin (\Theta 1 \text{ of P1})$$

Where, $\Theta 1$ is a due north reference angle of a link positioned on an extending line in a traveling direction of the moving object at the first location and an attitude angle of previous map-matching location.

Paragraph [0047] on pages 14-15 has been amended as follows:

Here, if the location data on the arbitrary estimated location is calculated, the second location P2 on the digital numeric map that is the shortest distance Min D from the location data is map-matching and the map-matching location P2 is estimated to be the location to which the moving object moved in a in an estimation unit time.

Paragraph [0052] on pages 15-16 has been amended as follows:

Here, the method of the moving to determine whether the moving object is in the visible region or the shadow area by using the GPS location data is ~~as similar to the first~~ embodiment. For example, HDOP (Horizontal Dilution Of Precision) code is calculated by using a calculation algorithm provided from NMEA-0283 format. If HDOP is less than the predetermined value, it is determined that the moving object is in the visible region. If HDOP is greater than or equal to the predetermined value, it is determined that the moving object is in the shadow area.

Paragraph [0067] on pages 21-22 has been amended as follows:

Therefore, when the moving object enters the shadow area B, the last map-matching location Pm of the visible region is obtained and referred to as a reference point. The moving straight distance that the moving object can move ($Pm \rightarrow Pm'$) can be determined based on the velocity of the moving object in a unit time. The link distance (d1) from the reference point Pm of the moving object to the first interpolated point Pa is subtracted from the distance (Ld1) of the first link L1 to obtain the residue distance (d2) of the first link. The residue distance (d2) of the fist link is compared with the moving straight distance ($d2 + d3$) of the moving object, so that it can be determined whether the estimated location of the moving object is on the first link.